Space Weather Forecast

Issued on Monday, 28 August 2023 at 01:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate-class flares (R1-R2 Blackouts). Weak coronal mass ejection arrival possible Day 3 (30 Aug) with slight chance of G1/Minor Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, but with a declining trend in the early part of the 24 hours as the X-ray flux recovered from a long period Moderate-class flare just prior to this period, from a source over the east limb. There are five sunspot regions on the visible disc, three of which are small and simple, however there are two sunspot groups of interest at this time. A region in the southeast remains the most complex, with a persistent area of magnetic complexity, but has been largely inactive. A larger region near centre disk has seen much of its magnetic complexity fade, but retains a north-south magnetic alignment which could have some instability. A region over the east limb (not yet visible) gave the long period flare mentioned above, so this area is one to watch in the coming days.

No new Earth directed Coronal Mass Ejections (CMEs) have been seen in available imagery over the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds were at mostly background levels. Wind speeds slowly eased from near 400 km/s to around 350 km/s. The interplanetary magnetic field was weak throughout. The north-south component has been mainly southward directed, varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be generally Low, but with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: A CME may give a glancing impact at Earth sometime on Day 3 (30 Aug), though this is low confidence. There are no other Earth-directed CMEs currently forecast. Wind speeds are currently at background levels, but with a possible coronal hole fast wind arrival during Day 1 (28 Aug). Wind speeds may reach slightly elevated levels of 400-450 km/s, although confidence is low. Should this fast wind occur, wind speeds are then expected to slowly ease into Days 2 and 3 (29-30 Aug). In the absence of any fast wind, background wind speeds are expected to persist until the potential CME arrival mentioned above.

Geomagnetic activity is expected to remain generally Quiet to Unsettled, with a chance of Active intervals on Day 1 in association with the possible fast wind. If the CME glance occurs on Day 3, activity may become Unsettled to Active with a slight chance of G1/Minor Storm intervals, with effects easing into Day 4 (31 Aug).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background levels, with just a slight chance of enhancement should any larger flares occur from the two larger regions on the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	15	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	35	35	35
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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